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| EXAMINER | |
|---|---|
| LEUNG, RICHARD L | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3744 | |

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/757,944 | BERNERT, ROBERT E. | |
| | Examiner | Art Unit | |
| | Richard L. Leung | 3744 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,3,4 and 7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4 and 7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 February 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

1. The replacement drawings were received on 07 February 2005. These drawings are not acceptable.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 15 and 15a. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application, but no new matter may be added. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

3. The amendment filed 07 February 2005 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the recitations of

"multiple-line carbonated bottling plant" (Reply, page 5, last line) and "use of the vaporizer assures that the heavy portions of the LP material may be continuously evaporated," (Reply, page 7, lines 2-3) were not mentioned previously in Applicant's original disclosure.

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Objections***

4. Claim 1 is objected to because of the following informalities: the preamble of the claim recites the phrase, "an improved method." It is suggested that the recitation of "an improved method" be changed to --a method--, and the recitation of "comprising" be changed to --wherein the improvement comprises-- in order to be in compliance with 37 CFR 1.75(e) which provides the guidelines for Jepson-style claims. Appropriate correction is required.

5. Claim 4 is objected to because of the following informalities: the first line of the claim recites the phrase, "An improved method." It is suggested that the recitation of "an improved method" be changed to --A method--. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1, 3, and 4 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to

one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The newly added limitation, "including both liquid and gas phases thereof through said vaporizer," does not appear to have proper support in Applicant's original disclosure. As best understood, Applicant's disclosure only mentions a liquefied gas (i.e. liquid phase) being introduced into the vaporizer and is silent regarding any said gas phase. Likewise, there does not appear to be proper support in the written description for the new limitation, "single stage." This rejection may be overcome by explicitly demonstrating where support for these limitations can be found in the disclosure.

With respect to claim 3 the newly added limitation, "said secondary external vaporizer having a liquid head pressure control regulator positioned between the liquid tank withdrawal line and the inlet of said secondary external vaporizer," does not appear to have proper support in Applicant's original disclosure. While Applicant discusses the use of a pressure reduction valve 20 between a liquid line 22 and vaporizer 16 in the embodiment illustrated in Fig. 2, this is not considered equivalent to a "pressure control regulator" as commonly understood. This rejection may be overcome by explicitly demonstrating where said "pressure control regulator" is enabled in the disclosure.

With respect to claim 4 the newly added limitation, "which in turn passes into a gas customer distribution system having varying pressure levels," does not appear to have proper support in Applicant's original disclosure. This rejection may be overcome by explicitly demonstrating where said "customer distribution system having varying pressure levels" is enabled in the disclosure.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by US 4321796 (Kohno). Kohno discloses, in a gas distribution system, a method of vaporizing a compressed liquefied gas in a tank 1 at ordinary temperature with an ordinary temperature vaporizer 3 though which said liquefied gas passes for vaporization thereof, comprising the step of passing said liquefied gas through a pressure reduction valve 13 so as to reduce its pressure prior to passing said gas through said vaporizer 3. By "ordinary," it is understood that Kohno is referring to the atmosphere or like conditions (see column 1, lines 51-52), and said vaporizer 3 is single stage, as best understood, since it is referred to singularly. Kohno discloses that said use of a pressure reducing valve is known in the art and is inevitable when a heat source providing nearly natural heat is utilized to evaporate the liquefied gas (column 4, lines 48-54). Passing said liquefied gas through said pressure reduction valve 13 inherently reduces the boiling point of said liquefied gas (because vapor pressure is reduced) and therefore inherently increases the difference between the vaporizing temperature (boiling point) of the compressed liquefied gas and the temperature of the ambient air available to supply heat to vaporize said liquefied gas. In other words, by lowering the boiling point (vaporizing temperature) of the liquefied gas, the difference between the

boiling point (vaporizing temperature) and the temperature of the ambient air would necessarily increase. While Kohno discusses the advantages of separating the gas and liquid phases of the fluid exiting said pressure reduction valve 13 in a chamber 2 prior to the step vaporization in vaporizer 3, Kohno also discloses that it is already well known in the art to pass both gas and liquid phases through said vaporizer (column 4, lines 48-54).

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 4321796 (Kohno) in view of US 2968163 (Beckman). Kohno discloses a method for vaporizing a compressed liquefied gas stored in a tank 1 at ordinary (atmospheric) temperature, said tank 1 containing fluid in both liquid and vapor phases. It is disclosed that vaporized gas from tank 1 may be withdrawn via a supply line 7 having a pressure control regulator 14, which would inherently decrease the pressure and temperature in said tank 1 (because of the decreased vapor pressure), and inherently cause heat to flow from the ambient air surrounding said tank 1 into said tank 1, subsequently raising the temperature of the gas stored there, because a temperature gradient is created. Kohno fails to disclose a secondary external vaporizer separate from said supply line 7 so as to increase the rate of heat transfer from the ambient air to said gas stored in said

tank 1, said secondary external vaporizer having a liquid head pressure control regulator positioned between the liquid tank withdrawal line and the inlet of said secondary external vaporizer. Beckman teaches a related system for storing and dispensing liquefied gases including a tank 11 containing a liquefied gas and having a pressure-building circuit 21 comprising a liquid withdrawal line 15, an external pressure building coil (vaporizer) 23, and a liquid head pressure control regulator (pressure-closing valve) 16 located between the liquid withdrawal line 15 and the inlet of said external vaporizer 23. In operation, pressure control regulator 16 opens during conditions of low pressure such that liquefied gas from tank 11 flows through withdrawal line 15 to external vaporizer 23 for evaporation, the evaporated gas then returning to the vapor space of tank 11 through conduit 22 to increase the pressure therein. Refer to column 6, lines 10-14. It should be noted that pressure-closing valve 16 is considered to be a "liquid head pressure control regulator," as recited by the claim, since said valve 16 is understood to open or close in response to sensed pressure of the liquid. See column 3, lines 1-4. It would have been obvious to one of ordinary skill in the art to have added the pressure-building system taught by Beckman to the tank 1 disclosed by Kohno because such a system would allow for the pressure inside the tank to be maintained at levels sufficient for dispensing the liquefied gas therein.

12. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4321796 (Kohno) in view of US 5214925 (Hoy et al.) and US 5069039 (Martin). Kohno discloses a method of vaporizing a compressed liquefied gas, which may be carbon dioxide (column 1, line 14), stored under pressure in a tank 1 wherein said

liquefied gas is passed through a vaporizer 3 and thence withdrawn in a gaseous state via an exit line 12 for distribution to customers. Said distribution to customers (i.e. "gas customer distribution system") may have varying pressure levels, as understood from column 5, lines 39-41 which indicates that the consumption of gas greatly varies with the time zone. Kohno also discloses the step of passing said liquefied gas through a pressure reduction valve 13 so as to reduce its pressure (and inherently its boiling point as well) prior to passing said gas through said vaporizer 3. Kohno fails to disclose that the pressure within said vaporizer 3 is simultaneously controlled to be above the triple point of carbon dioxide, said controlling means being a back pressure control regulator. Hoy et al. teach a refrigeration system using carbon dioxide comprising the use of a back pressure regulator 120 to maintain and control the pressure of said system above the triple point pressure of carbon dioxide, above about 60 psig (or about 75 psia). See column 17, lines 21-26. It would have been obvious to one of ordinary skill in the art to add to the exit line in the system disclosed by Kohno the back pressure regulator taught by Hoy et al. because Hoy et al. teach that such a back pressure regulator, when set to a pressure above the triple point of carbon dioxide, would prevent the formation of solid carbon dioxide (column 17, line 21-26) that could readily clog the vaporizer and exit line. Claim 7 requires that the pressure in the vaporizer be maintained above 75.10 psia corresponding to a boiling temperature of -69.9 degrees F. It is understood that this pressure and temperature merely corresponds to the triple point of carbon dioxide, and it can be understood that the combination of Kohno and Hoy et al. meets this further limitation. Kohno also fails to disclose a pressure relief valve positioned between said

vaporizer and said backpressure control regulator. Martin teaches the use of a pressure relief valve 220 immediately following a heat exchanger 215 in which carbon dioxide is heated. Martin teaches that said pressure relief valve 220 controls the maximum pressure of the warmed carbon dioxide (column 4, lines 43-45). It would have been obvious to one of ordinary skill in the art to include in the combination of Kohno and Hoy et al. the pressure relief valve taught by Martin immediately after the vaporizer (which is a heat exchanger) in order to control the maximum pressure of the vaporized liquefied gas, for example, as a way to prevent the pressure in the system from reaching unsafe levels.

***Response to Arguments***

13. Applicant's arguments filed 07 February 2005 have been fully considered but they are not persuasive.

Regarding claim 1, which now further contains the limitations of cancelled claim 2, Applicant argues that, "Since Kohno is not interested in a similar end result as applicant, it is not believed obvious in view of Kohno to use an increased atmospheric pressure differential in an atmospheric heat exchanger to gain a higher temperature differential and thus increased efficiency of the vaporizer." Applicant further asserts that, "what is not obvious is how to use an increased pressure differential to increase the temperature differential of the single stage atmospheric temperature air vaporizer by passing the liquid/gas mix directly thereinto after the pressure reduction step." The Examiner respectfully disagrees. It should be noted that since the rejections of these limitations are based on anticipation, obviousness is not at issue. Applicant's assertion

that Kohno is not interested in a similar end result as applicant does not negate the fact that Kohno discloses every limitation of the claim. Applicant seems to suggest that because Kohno teaches a phase separation step following the pressure reduction step, Kohno teaches away from increasing the "temperature differential." The use of a pressure reduction valve, as discussed in the rejection, inherently leads to an increase between the vaporizing temperature (boiling point) and the atmospheric temperature regardless of whether the gas and liquid phases are separated afterward. Indeed, it would appear that additionally separating out any gas phase would likely reduce the pressure and vaporizing temperature even more since vapor pressure is further reduced. Therefore the Examiner does not quite understand Applicant's argument that Kohno fails to achieve said "higher temperature differential." Furthermore minus any clear showing in Applicant's original disclosure, the newly added limitation of "including both liquid and gas phases thereof through said vaporizer" is considered to be impermissible new matter. Applicant's disclosure does not appear to mention both a gas and liquid phase (i.e. a "liquid/gas mix") entering said vaporizer. However for the sake of argument Kohno still discloses this limitation, as discussed above in the rejection. Again Applicant's attention is drawn to column 4, lines 48-54, which states:

> "It is known in the liquefied gas plant industry that an ordinary temperature liquefied gas is reduced in pressure by a liquid pressure reducing valve (expansion valve) to supply the resulting mixture of gas and liquid directly to an evaporator, the use of such liquid pressure reducing valve being inevitable when a heat source providing nearly natural heat is utilized."

Accordingly Applicant's arguments regarding the patentability of claim 1 are not considered persuasive.

Regarding claim 3, Applicant asserts that the newly added limitation reciting, "said secondary external vaporizer having a liquid head pressure control regulator positioned between the liquid tank withdrawal line and the inlet of said secondary external vaporizer," distinguishes the present invention from the prior art. Applicant's arguments however are unpersuasive because the introduction of a "liquid head pressure control regulator" is considered impermissible new matter since support for this limitation could not be found in the original disclosure. While Applicant discusses the benefits of providing a pressure reduction valve prior to the vaporizer, this is considered irrelevant because claim 3 does not include any mention of a pressure reduction valve. As stated above, a pressure reduction valve is not considered equivalent to a pressure regulator, and this is evidenced by Applicant's distinct and separate use of the terms in the written description. For example in the discussion of Fig. 2, Applicant refers to element 14 as a "pressure regulator" whereas element 20 is referred to as a "pressure reduction valve." Nevertheless, the amendment to the claim is insufficient in overcoming the new grounds of rejection necessitated by said amendment.

Regarding claim 4, which now contains the limitations of cancelled claims 5 and 6, Applicant argues that it would not have been obvious to modify Kohno with the teachings of Hoy et al. because of the amendment "to better set forth the use environment...where the gas is ultimately delivered to a customer line normally

including several sub lines...which may start up or shut down for any number of reasons so as to create varying pressure levels at the system exit line." These arguments are not persuasive. To begin with, the newly added limitation reciting, "which in turn passes into a gas customer distribution system having varying pressure levels," is considered to be an impermissible introduction of new matter since no clear support for this limitation could be found in Applicant's original disclosure. But for the sake of argument it is believed that Kohno already discloses this limitation, as discussed in the rejection above. Kohno expressly describes that the costumer consumption of gas may vary greatly (column 5, lines 39-41), which indicates that said distribution system has varying pressure levels. Applicant's more specific assertion that the present invention is distinguishable from the references "since Hoy et al describes a system always venting to a constant pressure...while the present applicant is, in effect, venting into a customer's supply manifold which varies in pressure," is also unpersuasive because this distinction is not reflected in the actual language of the claim. That is to say, the claim does not recite any limitation wherein there is "venting into a customer's supply manifold which varies in pressure." Accordingly Applicant's arguments regarding the patentability of claim 4 are not considered persuasive.

***Conclusion***

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard L. Leung whose telephone number is 571-272-4811. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl J. Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Richard L. Leung
Examiner
Art Unit 3744

CHERYL TYLER
SUPERVISORY PATENT EXAMINER

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